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POSTLARVAE OF THE BLUE MARLIN, *MAKAIRA NIGRICANS* FROM OFF JAMAICA

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POSTLARVAE OF THE BLUE MARLIN, *MAKAIRA NIGRICANS*, FROM OFF JAMAICA¹

By DAVID K. CALDWELL²

ABSTRACT: Two small specimens of this fish (201 and 206 mm. body length), collected at the surface on 17 September, are described and figured. The characters of dorsal fin outline and snout length, useful in distinguishing adult istiophorids, are shown to be invalid for specimens at least up to this size.

Two postlarvae (as defined by Hubbs, 1943) of the Atlantic Blue Marlin, *Makaira nigricans* Lacépède, were recently made available to me for study. The specimens, of a size previously unreported, are 201.4 and 206.0 mm. in body length (as defined by Rivas, 1956a). The locality was over Henry Holmes Bank (ca. 25 fathoms), about 13 miles northeast of Manchioneal, Portland Parish, off the northeast coast of Jamaica, West Indies. The specimens were dipnetted at the surface at night on 17 September 1961, by Mr. A. B. Francis. The fish reportedly were taken in company with flying fish (Exocoetidae). It is interesting to note that only two individuals, of nearly the same size, were taken and that this corresponds with reports made by sport fishermen (cited by de Sylva, 1958: 412, 415) that small specimens (about five pounds each) of Atlantic Blue Marlin are sometimes seen "in pairs" near West End, Bahamas.

The larger of the Jamaican specimens will be returned for deposit in the Science Museum, Institute of Jamaica, Kingston. The other has been deposited in the collection of the Los Angeles County Museum (LACM 1629). Figure 1 is taken from the latter specimen.

The identification of these istiophorids as *Makaira nigricans* is primarily based on the presence of a unique complex lateral line system forming a reticulate pattern on the sides of the body (Rivas, 1956b: 63; LaMonte, 1958: 386, fig. 4; de Sylva, 1958: 414, pl. 81) and the distinctive vertebral count of 11 precaudal and 13 caudal vertebrae (Robins and de Sylva, 1960: 400). Other characters used by Robins and de Sylva to distinguish this species from other istiophorids do not hold in individuals of the size of the present postlarvae or ones smaller.

In using the name *nigricans*, I follow Morrow (1959), although many recent authors (for example, LaMonte, 1955; Rivas, 1956b; Royce, 1957; LaMonte, Krumholz and de Sylva, 1958) refer to this species as *Makaira ampla* (Poey). Some recent writers (for example, Rivas, 1956b; Royce, 1957; Briggs, 1960) include both the Atlantic and Pacific oceans within the range of *M. nigricans*. In doing so, they include, among other

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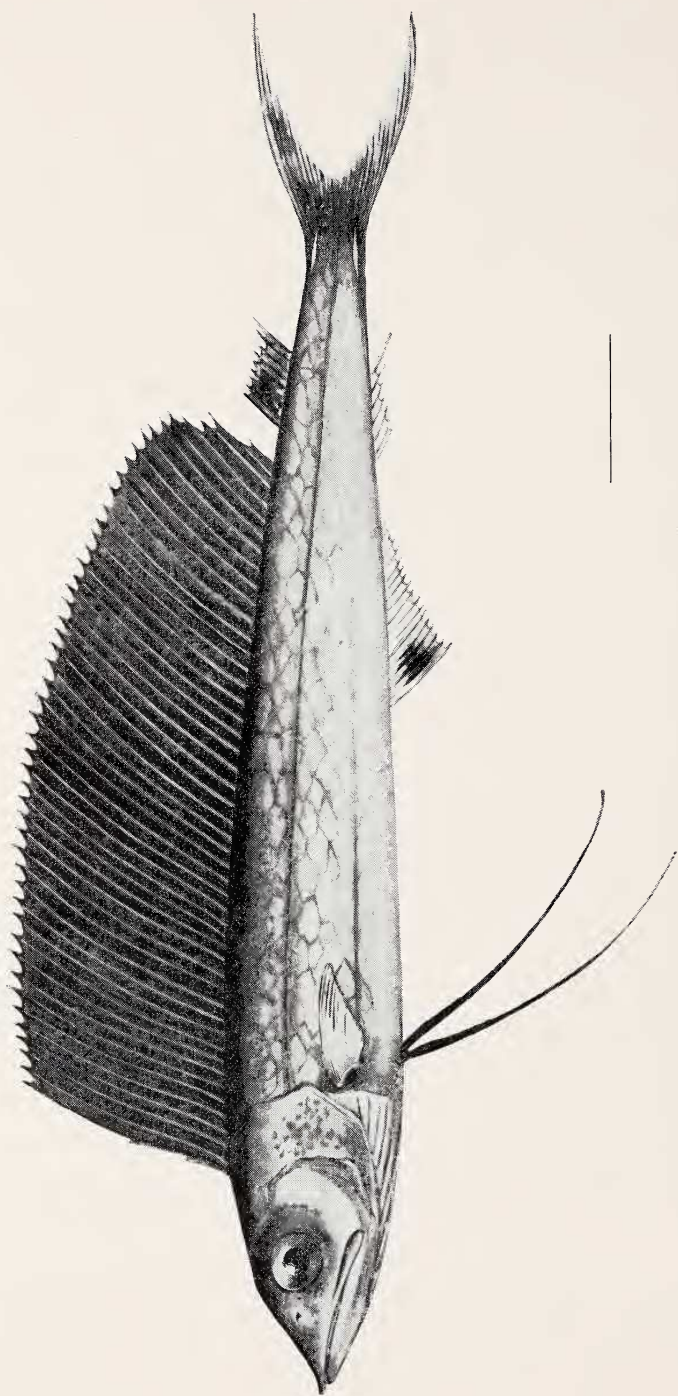


Fig. 1. Postlarval *Makaira nigricans* from off Jamaica. Line represents 25 mm.

nominal forms, the Pacific marlin *Eumakaira nigra* Nakamura (see Royce, 1957: 538). Morrow (1957: 104) suggested that the Atlantic and Pacific forms should retain subspecific rank. While it is not the purpose of the present report to enter into the discussion of the systematics of the Istiophoridae, it should be noted that the larger Jamaican specimen appears to be almost identical to an individual of the same size (a difference of only two millimeters body length) of *E. nigra* from the western Pacific. The latter specimen is shown in a photograph in Ueyanagi (1957: pl. 3, fig. 1) and, apparently in the same photograph, in Ueyanagi and Yabe (1959: pl. 1, lower). Judging from the fins of my specimen, I must question the accuracy of the portrayal of the first dorsal fin in the line drawings of specimens of similar size illustrated as figures 3 and 4 by Ueyanagi (1957). The posterior rays of this fin on his smaller specimen (his figure 3, of a fish the same size as the larger Jamaican specimen) appear to be too short, and the termination of the fin, at least in my material (see figure 1, herein), is not so sloping, but rather is more abdupt. It is likely that the same is true for Ueyanagi's larger specimen (1957, fig. 4).

Atlantic Blue Marlin of juvenile size (as small as 846 mm. body length) have been described and illustrated with photographs by de Sylva (1958). Gehringer (1956) figured with drawings three larval istiophorids which he referred either to the genus *Tetrapturus* (which he favored) or to the genus *Makaira*. His specimens were 11.3 to 45.0 mm. in standard length, and, thus, would have a slightly longer body length (about 12.4 to 47.0 mm., based on his figures). Ueyanagi and Yabe (1959: 151) suggested that Gehringer's specimens were *M. nigricans*. As pointed out by LaMonte (1958: 390), the reticulated pattern illustrated on the side just below the middle of the dorsal fin on Gehringer's 45-mm. specimen (Gehringer, 1956: fig. 25) suggests the beginning of the complex lateral line system characteristic of *M. nigricans*. I have seen this specimen and concur. Verbal counts would verify the identification, but the presence of the complex lateral line system in itself leaves no doubt that at least Gehringer's 45-mm. specimen is *M. nigricans*. Gehringer feels that the smaller individuals in his series probably belong to the same species as his largest specimen. His material would then form a good graded developmental series from about 12 to 47 mm. body length. The Jamaican specimens help fill the gap, seemingly at an important point morphologically, between Gehringer's series and the larger juveniles and adults discussed by de Sylva (1958).

The succession of change in the outline of the extended dorsal fin in the composite Atlantic series thus formed (Fig. 2) shows a strong similarity (with the exception noted above in the outline of the fin of the postlarvae) to that illustrated by Ueyanagi and Yabe (1959: fig. 10) for the probably-identical *E. nigra*. The high dorsal fin of the very young invalidates the use of this character as a distinguishing one in identifying

young istiophorids. This was indicated by Robins and de Sylva (1960: 405) when they prefaced their istiophorid key (which stresses the outline of the extended dorsal fin) with the word "adults."

Changes in the relative length of the snout (spear in larger individuals) are also shown when the same composite series is formed using the available Atlantic material (Fig. 2). As with the character of dorsal fin outline, marked changes in the length of the snout also invalidate the use of snout (spear) length in identifying young istiophorids.

In the Jamaican specimens, the minute teeth are conical and irregular in size, slightly recurved, and in several irregular rows extending to the tip of each jaw. The body is covered with small, cycloid scales. The paired keels on the caudal peduncle have begun to form. The tip of the snout on the larger specimen is broken off, but in general appearance (and judging from a comparison of the figures of a specimen of the same size and one 81 mm. longer included by Ueyanagi, 1957, figs. 3 and 4) it appears that it originally was the same comparative length as that of the intact snout on the smaller specimen (Fig. 1).

Although color notes were not made of the live specimens, it is presumed that they were dark above and lighter below as they are in alcohol preservative. From their present appearance, it probably also can be assumed that the upper darker shades were blue and that the now whiteish lower portions were silvery. Such color is typical of young pelagic fishes in general (Hubbs, 1941: 184) and also conforms with the color of freshly-captured adult Atlantic Blue Marlin that I have seen. In preservative, the first dorsal and pelvic fins are dark; the first anal fin has a dark blotch toward its anterior portion; the caudal fin, second anal fin, and upper inner surface of the pectoral fins are blotched with dusky pigment (the pectoral also has a darkened upper edge); and the second anal fin is clear.

In order to facilitate comparisons between the Jamaican specimens and others of different sizes described elsewhere, I have included a detailed series of counts and measurements as Table 1. These data were taken in the manner suggested by Rivas (1956a). Measurements were made with the aid of dial calipers calibrated to tenths of a millimeter. Fin-ray and vertebral counts were made with the aid of X-rays.



Fig. 2. Diagrammatic representation of the succession of ontogenetic change in extended dorsal fin outline and development of snout (spear) in a series of Atlantic *Makaira nigricans*. (1) Taken from a 47-mm. body length specimen (Gehringer, 1956: fig. 25). (2) Taken from a 201-mm. B.L. specimen (Fig. 1, this paper). (3) Taken from an 846-mm. B.L. specimen (de Sylva, 1958: pl. 81). (4) Taken from a 1320-mm. B.L. specimen (de Sylva, 1958: pl. 81). (5) Taken from an adult specimen (de Sylva, 1958: pl. 82, and my own unpublished file of photographs).

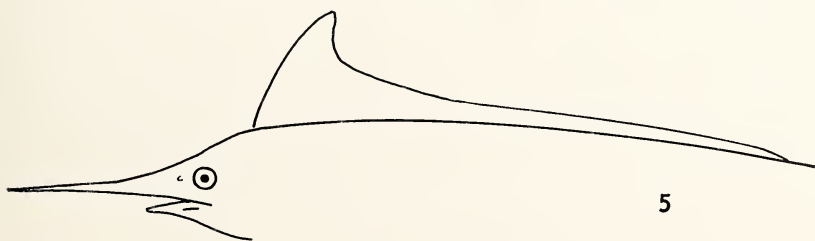
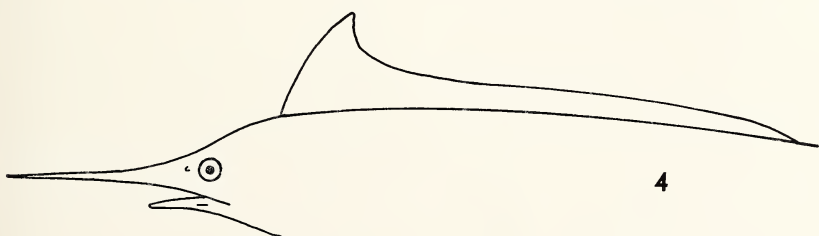
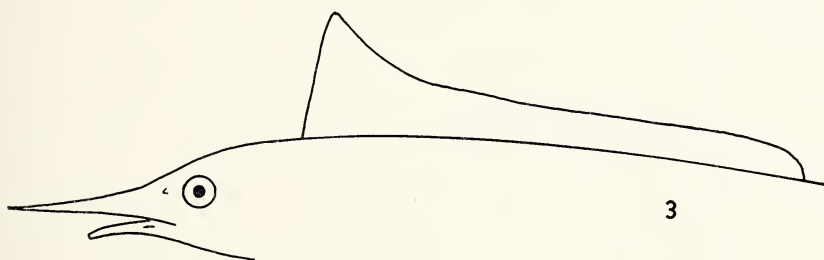
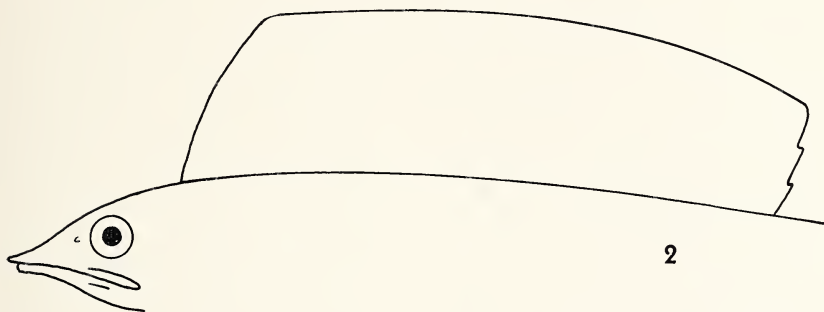
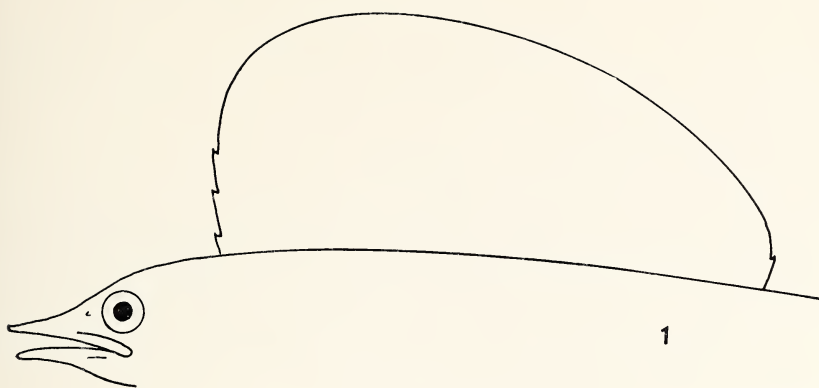


TABLE 1

Morphometric (expressed in mm.) and meristic data for two postlarval specimens of *Makaira nigricans* from off Jamaica. Empirical data are presented first, followed by their expression as percentage of body length. Unless otherwise indicated, the measurements follow Rivas (1956a), and the numbers in parentheses refer to his numbered definitions. Abbreviations used in the following table are: D₁ = spinous or first dorsal fin; D₂ = second dorsal fin; A₁ = first anal fin; A₂ = second anal fin; P₁ = pectoral fin; P₂ = pelvic fin; orig. = origin (in reference to fins); c.p. = caudal peduncle.

Character	Specimen 1		Specimen 2	
	Empirical	% Body Length	Empirical	% Body Length
Body length (1)	201.4	—	206.0	—
1st predorsal length (3)	35.4	17.6	37.4	18.2
2nd predorsal length (4)	158.2	78.5	162.8	79.0
Prepectoral length (5)	49.2	24.4	49.5	24.0
Prepelvic length (6)	50.1	24.9	50.8	24.7
1st preanal length (7)	119.4	59.3	120.5	58.5
2nd preanal length (8)	153.4	76.2	157.5	76.5
Orig. D ₁ to orig. P ₁ (9)	24.5	12.2	24.1	11.7
Orig. D ₁ to orig. P ₂ (10)	31.5	15.6	30.4	14.8
Orig. D ₂ to orig. A ₂ (11)	17.6	8.7	18.2	8.8
Orig. P ₂ to vent (12)	61.7	30.6	63.3	30.7
Orig. P ₂ to nape (13)	33.6	16.7	33.0	16.0
Greatest body depth (14)	28.1	13.95	29.2	14.2
Depth at orig. D ₁ (15)	26.4	13.1	25.7	12.5
Depth at orig. A ₁ (16)	22.7	11.3	21.8	10.6
Least depth c.p. (17)	8.4	4.2	8.5	4.1
Width at P ₁ base (18)	12.8	6.4	14.6	7.1
Width at A ₁ orig. (19)	10.0	4.96	11.2	5.4
Width at A ₂ orig. (20)	8.8	4.4	8.5	4.1
Width c.p. at upper keel (21)	4.3	2.1	4.1	1.99
Length upper keel (22)	8.8	4.4	7.4	3.6
Length lower keel (23)	8.8	4.4	7.4	3.6
Head length (24)	48.5	24.1	49.9	24.2
Snout length (25)	17.1	8.5	17.8	8.6
Bill length (26)	18.8	9.3	broken	—

Character	Specimen 1		Specimen 2	
	Empirical	% Body Length	Empirical	% Body Length
Preopercular length (27)	36.9	18.3	38.3	18.6
Maxillary length (28)	26.7	13.3	27.2	13.2
Orbit diameter (29)	9.6	4.8	9.4	4.6
Interorbital width (31)	14.4	7.1	13.5	6.6
Tip of mandible to tip of bill (32)	1.9	0.9	—	—
Depth of bill (33)	1.5	0.7	1.1	0.5
Width of bill (34)	1.4	0.7	1.3	0.6
Orig. D ₁ to edge of fin (35)	37.6	18.7	39.0	18.9
Length D ₂ base (36)	11.4	5.7	11.9	5.8
Length A ₁ base (37)	19.2	9.5	19.7	9.6
Length A ₂ base (38)	13.7	6.8	13.6	6.6
Height D ₁ (39)	37.6	18.7	39.0	18.9
Length 25th D ₁ spine (40)	42.0	20.9	42.3	20.5
Height D ₂ (41)	11.2	5.6	11.5	5.6
Height A ₁ (42)	19.7	9.8	19.5	9.5
Height A ₂ (43)	7.3	3.6	8.2	3.98
Length P ₁ (44)	19.4	9.6	20.3	9.9
Length P ₂ (45)	64.6	32.1	58.4	28.3
Length last D ₂ ray	9.2	4.6	9.4	4.6
Length last A ₂ ray	8.3	4.1	8.8	4.3
Orig. D ₁ to orig. D ₂	123.7	61.4	126.9	61.6
Anus to orig. A ₁	4.4	2.2	6.2	3.0
Number D ₁ spines	42	—	42	—
Number D ₂ rays	6	—	6	—
Number A ₁ spines	14	—	14	—
Number A ₂ rays	6	—	6	—
Number P ₁ rays (left/right)	20/21	—	19/21	—
Number precaudal vertebrae	11	—	11	—
Number caudal vertebrae	13	—	13	—

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